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## ANIMAL TREAT

### SPECIFICATION

#### Background of the Invention

#### Field of the Invention

The invention relates to a treat to be chewed by pet animals.

#### Description Of The Prior Art

Dog treats made from pig ears have been popular recently. Pig ears are removed from a pig, dried and seasoned, and sold to pet owners which give the processed ears to their dogs to chew. Problems have occurred in the use of these treats in that the ears may have salmonella and may be dirty, oily and hairy.

U.S. Patent Nos. 3,368,528; 5,635,237; 6,033,715; 6,042,873; 6,060,100; and U.S. 6,277,420B1 disclose pet treats made from animal skins or parts.

#### Summary of the Invention

It is an object of the invention to produce a replica preferably of a pig ear as a dog treat which is clean, safe, and which can be produced consistently.

It is a further object of the invention to provide a new and useful smoking system and process for smoking the replica to obtain a smoked taste and smell.

The replicas are produced from the skin of a pig taken from its body. The skin is cut into a given shape, folded to a desired shape and pressed and heated to produce a replica of a pig's ear that will retain its shape.

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### Brief Description of the Drawings

Fig. 1 is an isometric view of the front side of the replica of a pig ear of the invention.

Fig. 2 is a view of the rear side of the ear of Fig. 1.

Fig. 3 is an edge view of the ear of Fig. 1 as seen from the left edge of the ear of Fig. 1.

Fig. 4 is an edge view of the ear of Fig. 1 as seen from the bottom side.

Fig. 5 is an enlarged cross-section of Fig. 1 taken along lines 5-5 thereof.

Fig. 6 illustrates a press used in forming the ear of Figs. 1-5.

Fig. 7 is a top plan view of the female die used in the press of Fig. 6.

Fig. 8A is an isometric view of a portion of the die of Fig. 7.

Fig. 8B is the opposite side view of the die of Fig. 8A.

Fig. 9 is an end view of the female die of Figs. 7 and 8.

Fig. 10 is a plan view of the male die used in the press of Fig. 6.

Fig. 11 is an isometric view of the male die of Fig. 10.

Fig. 12 is a side view of the female and male dies of the press of Fig. 6.

Figs. 13-19 illustrates the steps followed in processing the skin of an animal to form a pressable skin shape which is applied to the dies of Figs. 7-12 to form the final shape of the ear of Figs. 1-5.

Fig. 20 illustrates a heater for heating the pressed ears.

Fig. 21 is a side view of a conveyor system for smoking the ears after they have been heated.

Fig. 22 is a cross-sectional view of the system of Fig. 21.

Fig. 23 is a portion of a top plan view of the conveyor belt of the system of Figs. 21 and 22.

Fig. 24 is an electric heating device of the system of Figs. 21-23.

Fig. 25 is an end view of the exit end of the conveyor system of Figs. 21-23.

Fig. 26 illustrates one of the trays and containers employed in the conveyor system for holding a ingredient mixture for smoking purposes.

Fig. 27 illustrates a system for sterilizing the smoked ears.

### Description of the Preferred Embodiments

Referring now to Figs. 1-5 the replica of a pig's ear is identified at 31. The front and back sides of the ear are shown at 33 and 35. The two side edges are identified at 37 and 39, the top edge at 41 and the bottom edge at 43. The ear 31 comprises four layers 31A, 31B, 31C and 31D.

In forming the ear, and referring to Figs. 13-19, the skin 51 from the body of a pig (which excludes the head and limbs) is provided. Pig skin is employed since it is edible and digestible. The hair is removed from the outside of the skin and any fat on the inside is removed leaving a skin having a thickness of about 1 mil. A rectangular blank 61 is cut from the skin 51. The blank 61 is folded at 63 as shown in Fig. 13 to form the folded skin of Fig. 14. The folded skin of Fig. 14 is folded at 65 to form the folded skin of Fig. 15. The folded skin of Fig. 15 is folded at 67 to form the folded skin of Fig. 16. The folded skin of Fig. 16 is cut along solid line 69 and folded along lines 69 and 71 under the flap 73 to form the folded skin at Fig. 17. The folded skin of Fig. 17 is folded along line 75, 77 and located under the flap 73 to form the folded skin of Fig. 18. The folded skin portion 78 is folded under the flap 79 to form the folded skin blank 81 of Fig. 19 which basically has four layers.

Two of the folded ear blanks 81 then are placed in two cavities 91 and 93 of a female die 95 of a press 97. Referring to Figs. 6, 7, and 12, the cavities 91 and 93 define two front sides of two ears 31 with their lower edges 43 abutting each other. A male die 99 is provided having two dies members 101 and 103 which define the rear sides of the two ears with their lower edges abutting each other.

Referring to Figs. 7 and 8, the female die 95 has two elongated walls 111 and 113 which are movably supported on a base 114 which can move on the base 114 toward and away from opposite edges of the cavities 91 and 93 and two shorter walls 121 and 123 which are moveably supported on the base 114 and which can move on the base 114 toward and away from the pointed edges of the cavities 91 and 93 respectively.

The inside edges of the walls 111, 113, 121, 123 define the outside shape of two pig ears.

Wall 111 has two pairs of upper and lower slots 111S1 formed therethrough at end 111A and two pairs of upper and lower slots 111S3 formed therethrough at end 111B. Wall 113 has two pairs of upper and lower slots 113S1 formed therethrough end 113A and two pairs of upper and lower slots 113S3 formed therethrough at end 113B. A pair of rods 115 with threaded ends 115A and 115B moveably extend through slots pairs 111S1 and 113S1 and a pair of rods 117 with threaded ends 117A and 117B movably extend through slot pairs 111S3 and 113S3 respectively. The rods 115 extend through and are fixedly secured to the wall 121 and the rods 117 extend through and are fixedly secured to the wall 123.

Nuts 115C are screwed to each of the rod ends 115A and secure one end of a spring 119 to each rod end 115A. The other ends of the springs 119 are attached to the wall end 111A at studs 131. Nuts 115D are secured to rod ends 115B and secure one end of a spring 121 to each rod end 115B. The other ends of the springs 121 are attached to the wall end 113A at studs 133. Nuts 117C are secured to each of the rod ends 117A and secure one end of a spring 123 to each rod end 117A. The other ends of the springs 123 are attached to the wall end 111B at studs 135. Nuts 117D are secured to each of the rod ends 117B and secure one end of a spring 125 to each rod end 117B. The other ends of the springs 125 are attached to the wall end 113B at studs 137.

Springs 141 and 143 are connected to lower studs 131 and 135 respectively and to the base 114 at 145 and 147 to normally urge the wall 111 away from the female cavities 91 and 93. Springs 151 and 153 are connected to lower studs 133 and 137 respectively and to the base 114 at 155 and 157 respectively to normally urge the wall 113 away from the female cavities 91 and 93. Springs 119 and 121 normally urge the end wall 121 away from the pointed end of the female cavity 91. Springs 123 and 125 normally urge the end wall 123 away from the pointed end of the female cavity 93. It is to be noted that the rods 115 and 117 can slide toward and away from the pointed ends of the female cavities 91 and 93

in their slots 111S1, 113S1 and 111S3, 113S3 to move their walls 121 and 123 toward and away from the pointed ends of the female cavities 91 and 93.

The outside upper ends of the walls 111 and 113 are beveled at 111SB and 113SD.

Referring to Figs. 10 and 11, the male die member 99 has four guide blocks 161, 163, 165, 167 attached to its base 99B spaced from the two male dies 101 and 103. The blocks 165 and 167 have beveled inner edges 165B and 167B.

The female die member 95 is mounted on the stationary base 171 of the press 97 with the dies 91 and 93 facing upward and the male die member 99 is mounted on the downward facing surface of a movably member 173 of the press. The male die members 101 and 103 face downward. The member 173 is moved upward or downward by a piston 175 which extends through upper member 177 to a hydraulic cylinder 179. Stationary member 177 is supported by rods 181 coupled to base 171. The rods 181 also act to guide movement of the member 173. Hydraulic conduits 183 extend to the cylinder 179 from a control system 185 for controlling upward or downward movement of the piston 175 and hence the member 173. Movement of the piston 175 moves the male die member 99 toward or away from the female die member 95.

In using the press, the male die 99 is moved upward and two of the skin blanks 81 are laid in the female cavities 91 and 93 with their edges 43 next to each other at the juncture 92 of the female cavities 91 and 93. The smaller edges 85 will be located at the edge 91E of the die 91 and at the edge 93E of the die 93. The edges of the blanks 81 will actually overlap the edges of the dies 91 and 93.

The male die member 99 then will be moved downward. The inside edges of blocks 161 and 163 will engage the beveled edges 111SB and 113SB of the walls 111 and 113 and move the walls 111 and 113 inward and the beveled edges 165B and 167B of the blocks 165 and 167 will engage the outside edges of the end walls 121 and 123 and move the walls 121 and 123 inward. Die member 99 will continue to move downward until the male dies 101 and 103 engage and press the skin

blanks 81 against the female cavities 91 and 93 to shape the skin blanks into the shape of the ear 31. In this process, any of the overlap of the skin blanks 81 over the edges of the female dies 91 and 93 will be moved inward and compressed to form two ears having the shape of ear 31 of Figs. 1-5.

In the process, in forming the replica of the ear 31, the following steps are carried out. The skin is removed from the pig. Hair and fat is removed from the outer and inner sides of the skin. The skin is sliced to a desired shape. The skin is expanded with limestone (or lye, aqueous alkali) for two days. The alkali is taken off of the skin and the skin is counter acted with a mild acid ( $H_2SO_4$ ). The skin then is dried for two days. The drying raw skin then is placed into clean water to make it soft. The skin is cut into a specific shape (rectangular as shown in Fig. 13) and folded into a shape (of Fig. 19) which will contain 4 layers of pig skin. The folding process is shown in Figs. 13-19. The folded skin then is pressed and shaped in the hydraulic press as described previously at about 5000 psi for about 30 seconds and then removed. The pressed skin then is dried in an oven 201 (see Fig. 20) at 40-50 degrees C for about 48 hours; 70 degrees C for about 2 hours; 75 degrees C for about 2 hours; and 85 degrees C for about 2 hours. Next the dried skin is smoked in a conveyor smoking system 203, with a special mixture of ingredients such as rice stalks, wheat hulls, Chinese red sugar, and sweet potato strips to obtain a smoked taste and smell.. The ear then is pressed a second time in the hydraulic press 97 to shape again any loose edges. Antiseptic is applied to the skin and it is sterilized at 205 (see Fig. 27) by ozone for one night. The skin then is packed in a germ free packing room.

The concentration of the mixture may be sugar 20%, wheat hulls 40%, rice stalks 20%, and sweet potato strips 20%.

In one embodiment, the rectangular blank 61 of Fig. 13 may have dimensions in inches of 6 X 13, however, these dimensions may vary.

Referring to Figs. 21-26, the conveyor smoking system 203 comprises an elongated frame 221 having two rollers 223 and 225 at front and rear ends F and R which support a continuous flexible wire belt 227 for movement above heaters 235A-235G and trays 229, 331 of

ingredients 233 in the form of a mixture as disclosed above. The belt 227 has elongated flexible metal (steel) wires 227A and transverse flexible metal (steel) wires 227B forming air spaces 227C. The frame 221 comprises a forward wall 221A; a rear wall 221B; a floor 221C for supporting the trays 229 and heaters 235A-235G; two side walls 211D and 221E and a top wall 221F supported by two upper trapezoidal side wall portions 221DT and 221ET define a heating cavity 222. The wire belt 227 moves between the upper side wall portions 221DT and 221ET and under the top wall 221F in the cavity 222 around the rollers 225 and 223. Rotation is clockwise as seen in Figs. 21-23.

The rollers 223 and 225 are fixedly connected to rods 243 and 245 which are rotatably supported by outward extending side wall portions 221DO and 221DE. A gear 251 is connected to one end of rod 245 which is rotated by an electric motor 253, the RPM of which is controlled by device 255. The RPM of the motor 251 determines the speed of travel of the belt 227 at its upper side from roller 223 to roller 225. The belt 227 is supported by a plurality of small diameter rollers 261 supported by the side walls 221D and 221E. A plurality of interior vertical walls 271 are supported by the side walls 221E and 221E and the bottom wall 221C defining a plurality of heating chambers 223A-223G. Chamber 225 is used to support the timing control 255 and a thermostat 275 used to control the current from an AC source 277 to the lead 235 of the coil heaters 235A-235G. Heaters 235A-235G are located in chambers 223A-223G respectively on the floor 221C below the trays 229. The heaters are connected to an AC source 279 by way of a switch 281. The side wall 221D has a plurality of slots 283 for allowing inserting and removal of the trays 229 with the mixture in containers 231.

The frame 221 is supported by legs 285.

The entrance and exit from the cavity 222 have flexible flaps 287 for maintaining the heat in the cavity 222 but allowing passage of the belt 227 and the pig ear replicas 231. In operation of the smoking system, the switch 281 is closed and the thermostat 275 is adjusted to obtain the desired heat in the chambers 223A-223G. After the desired chamber temperature is obtained, electrical power is applied to the motor 253 by

closing switch 256 and its RPM is adjusted by unit 255. The ear replicas 31 then are loaded on the front end of the belt 227 and they are carried by the belt 227 through the cavity 222 over the chambers 223A-223C and are smoked by the rise in heat and aroma from the mixtures 233 through the openings of the belt 227. At the rear end of the conveyor 227, the smoked ears 21 are removed from the belt 227.

In one embodiment, the distance between the outer sides of rollers 223 and 225 is about 12 meters. In order to smoke the ear replicas to obtain replica colors of light, medium, or dark, the RPM of the motor 253 is adjusted such that each ear replica 31 takes 2, 4, or 7 minutes respectively to pass from the front end to the rear end of the system 221 on the wire belt 227.